TRIFOLIUM MONANTHUM GRAY

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Some eight entities have been described in the *monanthum* group of *Trifolium* and at least fourteen different combinations have been made. The difficulty of application of these various names is caused by the large degree of intergradation which exists between all possible entities. Although the recognition of the four varieties proposed in the following treatment entails the addition of a new name, the geographical correlation of these four varieties seems to justify such action.

I wish to express my appreciation to the curators of the following herbaria for the loan of material: University of California, Berkeley, California (UC); Dudley Herbarium, Stanford University, California (DH); Pomona College, Claremont, California (P); Gray Herbarium, Harvard University, Cambridge, Massachusetts (G); Missouri Botanical Garden, St. Louis, Missouri (MBG); New York Botanical Garden, New York, New York (NY); Philadelphia Academy of Sciences, Philadelphia, Pennsylvania (PA); Intermountain Herbarium, Utah State Agricultural College, Logan, Utah (IH); and University of Washington, Seattle, Washington (W).

Key to Varieties of Trifolium monanthum

Leaflets of the upper leaves mostly acute, oblanceolate or elliptical.
- Plants moderately to strongly villose; peduncles usually bent near the top, the inflorescence thus at right angles to the peduncles .... d. *T. monanthum* var. *Eastwoodianum*
- Plants glabrous to sparingly villose; inflorescences usually erect on straight peduncles .... b. *T. monanthum* var. *Grantianum*

Leaflets of the upper leaves mostly rounded or retuse, obcordate to oblanceolate.
- Involucral lobes mostly 0.5–2 mm. long; stems 5–30 cm. long; plants usually noticeably villose .... c. *T. monanthum* var. *parvum*
- Involucral lobes mostly more than 2 mm. long, if shorter, the stems less than 5 cm. long; plants glabrous or sparingly villose .... a. *T. monanthum* var. *typicum*

a. T. monanthum Gray var. **typicum** nom. nov. *T. monanthum* Gray, Proc. Am. Acad. 6: 523. 1865. *T. monanthum* Gray f. *spatiosum* McDerm., No. Am. Sp. Trifolium 98. 1910 (based on *Hall* and *Chandler 613,* Black Mountain, Fresno County, California, July, 1900, UC; isotypes, MBG, NY, DH).

Glabrous to sparingly villose; stems 1–10 (20) cm. long; leaflets obcordate, obovate, or oblanceolate, rounded, truncate, or retuse at the apex, 2–5 mm. wide, 4–12 mm. long; inflorescences

1–2 (4)-flowered; peduncles usually straight, the flowers erect; involucral lobes 1–5 mm. long; calyx teeth shorter than or about equal to the tube in length. Flowering from June to August.

Type. Soda Springs in the Upper Tuolumne Valley, California, June 26, 1863, elevation 8600 feet, *W. H. Brewer 1704* (G; isotypes, UC, DH).

Distribution. Sierra Nevada from Plumas County to Tulare County, California, east throughout the mountain ranges of Nevada, South Coast Ranges in Ventura and Los Angeles counties, California; along streams and in meadows, 5000 to 11,500 feet elevation.

Representative material. *W. A. Archer 5468; I. W. Clokey 7562, 7984; V. Duran 3078; R. Ferris 3745, 8960, 8993; A. A. Heller 9306, 10200; C. L. Hitchcock 5462; A. H. Holmgren 1609; B. Maguire 22500, 22547; W. H. Shockley 499.*

The typical variety is best exemplified by material from the region from Mount Rose, Nevada, to Yosemite National Park, California. Specimens collected from Lake Tahoe to Butte and Plumas counties and in Fresno County, California, and the Charleston Mountains of Nevada are often somewhat intermediate between the typical variety and the varieties *Grantianum* and *Eastwoodianum*. The leaflets tend to be larger and more nearly acute than those of the typical group and in some cases the calyx teeth are longer, although all are glabrous or very sparingly pubescent. Some, at least, of these have been referred to *T. monanthum* f. *spatiosum* by McDermott but are not sufficiently different to be so recognized.

b. T. MONANTHUM Gray var. GRANTIANUM (Heller) Parish, Plant World 20: 220. 1917. *T. Grantianum* Heller, Muhlenbergia 1: 136. 1906. *T. monanthum tenerum* Parish, Bot. Gaz. 38: 461. 1904, name mistakenly applied. *T. monanthum* Eastw. *apud* Parish, loc. cit., listed in synonymy. *T. simulans* House, Bot. Gaz. 41: 341. 1906 (based on *H. M. Hall 710,* Strawberry Creek, San Jacinto Mountains, California, July 22, 1897; isotypes, G, UC). *T. monanthum* Gray var. *Grantianum* Zeile *apud* Munz, Man. So. Calif. Bot. 255. 1935.

Glabrous or but sparingly villose; stems 3–30 cm. long; leaflets oblanceolate to obovate or more commonly elliptical, acute (rarely somewhat rounded but then mucronate), spinose-serrate, 2–5 mm. wide, 7–20 mm. long; inflorescences (1) 3–6-flowered, peduncles usually straight, the flowers erect; involucral lobes (1.5) 3–5 (6) mm. long; calyx teeth longer or shorter than the tube. Flowering from late May to July.

Type. Mount San Gorgonio, San Bernardino Mountains, California, July 23, 1904, *Geo. B. Grant 6343* (W, no. 79713; isotypes, UC, P, DH).

Distribution. San Bernardino, San Jacinto, and San Gabriel

mountains of southern California, moist stream banks and meadows, 5000 to 9500 feet elevation.

Representative material. *V. Duran 3525; H. M. Hall 710, 1812, 2200, 2463, 2552, 7510, 7564, 7571; A. A. Heller 8937; P. A. Munz 6010, 8458, 8610, 8781, 10485, 10486, 10697, 15385; J. Roos 2362.*



Fig. 1. Distribution of *Trifolium monanthum.*

The variety *Grantianum* occurs only in the mountains of southern California where it is not likely to be mistaken for any other plant. The very acute leaflets are unlike those of any other variety except var. *Eastwoodianum,* a plant which is always much more pubescent and which does not occur south of Tulare County. *T. simulans* House is considered a synonym; isotypes of this species differ from the type of var. *Grantianum* only in being a little larger and in having longer calyx teeth.

c. T. MONANTHUM Gray var. PARVUM (Kell.) McDerm., No. Am. Sp. Trifolium 105. 1910. *T. pauciflorum* Nutt. var. *parvum* Kellogg, Proc. Calif. Acad. Sci. 5: 54. 1873. *T. multicaule* Jones, Bull. Torrey Bot. Club 9: 31. 1882 [based on *M. E. Jones (2592?)*, Soda Springs, Nevada County, California, July 30, 1881 (?), P; isotypes, PA, IH]. *T. parvum* (Kell.) Heller, Muhlenbergia 1: 114. 1905. *T. monanthum* Gray var. *parvum* (Kell.) McDerm. f. *glabrifolium* McDerm., op. cit. 108 (based on *Hall* and *Babcock,* Porcupine Flat, Yosemite National Park, California, July, 1902, UC, no. 33605).

Moderately villose or rarely nearly glabrous; stems 4–30 cm. long; leaflets obovate to oblanceolate, rounded at the apex, serrulate, 2–7 mm. wide, 4–20 mm. long; inflorescences (1) 4–8 (10)-flowered, peduncle usually bent below the inflorescence, the flowers thus more or less at right angles to the peduncle; involucral lobes 0.5–2 (5) mm. long; calyx teeth usually equal to or longer than the tube. Flowering from June to August.

Type. Cisco, Sierra Nevada, California, July 6, 1870, *A. Kellogg* (isotypes, NY, UC).

Distribution. Sierra Nevada from Nevada County to Fresno

County, California, common in meadows, open areas in forest, and along streams, 5000 to 9000 feet elevation.

Representative material. *H. M. Hall 256, 3385, 3654, 4776, 8737, 8740, 8759, 8775; A. A. Heller 6942, 8986, 9831, 12151, 13296; M. E. Jones 2592.*

This variety is most easily distinguished by the reduced involucres and the usually 4–8-flowered inflorescences which appear to be more or less at right angles to the peduncles. I have not seen the type but the isotypes represent a depauperate, few-flowered phase. The more abundant and larger phase with 5–8-flowered inflorescences is represented by the type collection of Jones' *T. multicaule.*

d. T. MONANTHUM Gray var. **Eastwoodianum** nom. nov. *T. tenerum* Eastwood, Bull. Torrey Bot. Club 29: 81. 1902, not *T. monanthum tenerum* Parish, Bot. Gaz. 38: 461. 1904.

Moderately to rather densely villose; stems 10–35 cm. long; leaflets oblanceolate to elliptical, often very narrowly so, acute, conspicuously spinose-serrate, 2–5 mm. wide, 7–18 mm. long; inflorescences (1) 3–4 (7)-flowered, peduncles usually bent below the inflorescences and the flowers thus seemingly at right angles to the peduncles; involucral lobes (2) 3–4 (5) mm. long; calyx teeth usually a little longer than the tube. Flowering in July and August.

Type. Summit, trail to South Fork of King's River, California, July 1–13, 1899, *A. Eastwood* (isotype, UC).

Distribution. Sierra Nevada from Tuolumne County to Tulare County, California, moist stream banks and meadows, 5000 to 10,000 feet elevation.

Representative material. *M. S. Baker 4450b; W. R. Dudley 1576, 2094; H. M. Hall 437, 5565; R. Hopping 360; P. A. Munz 7566, 15936.*

This variety is somewhat similar to var. *Grantianum* in respect to leaflet characters but is always conspicuously villose and the inflorescences are usually at right angles to the peduncles. By these two characters the two varieties can be easily distinguished, especially when considered in connection with their geographical separation. This variety has been known as *T. monanthum* var. *tenerum* based on a publication by Parish (Bot. Gaz. 38: 461. 1904) in which he gave *T. monanthum* Eastwood (probably intended as *T. tenerum* Eastw.) as the basis for the name and cited two specimens, both of which belong to the variety *Grantianum.* One of the specimens cited is the type collection of *T. monanthum* var. *Grantianum* (Hell.) Parish so that Parish's var. *tenerum* becomes a synonym of var. *Grantianum,* necessitating a new varietal epithet for the entity in question.

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